Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PROBLEMS.

9. Proposed by CHARLES E. MYERS, Canton, Ohio.

A ladder inclined at an angle of 60° to the horizon rests with one end on a *rough* pavement and the other against a *smooth* vertical wall. If the coefficient of friction between the foot of the ladder and the pavement is $\frac{1}{6}\sqrt{3}$, to what height can a man ascend before the ladder will begin to slip?

10. Proposed by G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.

A paraboloid floats in a liquid which fills a fixed paraboloidal shell; both the paraboloid and the shell have their axes vertical and their vertices downward: the latus rectum of the paraboloid and shell are equal, and the axis of the shell is m times that of the paraboloid. If the paraboloid be pressed down until its vertex reaches the vertex of the shell, so that some of the liquid overflows, and then released, it is found that the paraboloid rises until it is just wholly out of the liquid, and then begins to fall. Prove that (1) the densities of the paraboloid and liquid are in the ratio $2[m^2+m+1-(m+1)\sqrt{(m^2-1)}] : 3\sqrt{(m+1)\div(m-1)}$, the free surface of the liquid being supposed to remain horizontal throughout the motion; and (2) if cone and conical be used, the ratio is $3[m^4-1-(m^3-1)\sqrt[3]{(m^3-1)}] : 4\sqrt[3]{(m^3-1)}$, the vertical angles being equal.

Solutions to these problems should be received on or before May 1st.

* * *

DIOPHANTINE ANALYSIS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTION TO THE CELEBRATED INDETERMINATE EQUATION.

$$x^2-Ny^2=\pm1.$$

By A. H. BELL Hillsboro, Illinois.

[Continued from February Number.]

It will already be noted, that whenever the denominator of y in (A) or the converging difference (as it is called) becomes $+1$, then the denominator $m^2N-n^2=+1$, by changing signs etc. is $n^2-Nm^2=-1$, and when the converging difference is -1, gives $n^2-Nm^2=+1$. The n and m in both cases occupy the position of x and y, in the original equation. Formula (A) giving the second higher values as x_2 and y_2 these answering always the $+1$ condition, and we now have the germ, of the formula as given by Legendre, to obtain the 2nd values after the 1st are obtained. This seems to be the extent to which the higher values of x and y were carried, except by actual computations.

$x^2-Ny^2=-1$, this class of numbers N, can always be known by this